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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,916	01/02/2004	David G. Boyers	042602C1	1893
7590	03/22/2006		EXAMINER	
Joseph H. Smith P.O. Box 32057 San Jose, CA 95152			LEUNG, PHILIP H	
			ART UNIT	PAPER NUMBER
			3742	

DATE MAILED: 03/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/750,916	BOYERS, DAVID G.	
	Examiner	Art Unit	
	Philip H. Leung	3742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-37 is/are pending in the application.
- 4a) Of the above claim(s) 32-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Newly amended claims 32-37 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 2-31 and claims 32-37 are directed to different species with distinct technical features. Claims 2-31 are drawn to a method and device for heating a flowing process liquid in a heating volume with a power density greater than 20 W/cc whereas claims 32-37 are drawn to a method and device for heating a flowing process liquid in a volume having a heated surface area and the ratio of the surface area to the heating volume being at least 2.0 /cm. The two groups are patentably distinct because each of these two groups does not require each other and the field of search for each group is also different. It should be noted that the original claim 1 is directed to a method including the feature only claimed in the first group, claims 2-31.

Since applicant has received an action on the merits for the originally presented invention (claim 1), this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 32-37 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

2. The term “cm-1” in the specification and the claims for indicating 1/cm is improper as it is not the same as “cm⁻¹”. Also, the term “w/cm3” in claims 3, 4 and 20-22 is improper. Correction is required.

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3. Claim 8 is objected to as a trademark (such as Teflon) must not be used in a claim.

Correction is required.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-31 are rejected under 35 U.S.C. 103(a) as being obvious over Pollock et al (US 4,257,157), in view of Rice et al (US 3,688,083) (both are newly cited).

Pollock shows method and device for heating a liquid where the power density can be greater than 20 w/cc, as it indicates that the heater "can operate at a power density of 1Kw/cc" (see col. 3, lines 10-13). Although it does not disclose the details of the liquid heater, it includes a prior art fluid heating system as described in British Pat. No. 1,182,421 (see col. 1, lines 7-16). It is pointed out that Rice is the US counter part of the '421 British patent. Rice shows a heating device with a heating volume 5 in a casing 3 having an inlet and outlet (4, 6) for a liquid. The casing includes a heating surface area (porous resistor body) (see Figure1 and col. 2, lines 11-62). It would have been obvious to an ordinary skill in the art at the time of invention to modify Pollock to include an inlet and outlet in the liquid heating device so that it can be operated as a continuous flowing liquid heater as shown in Rice. In regard to claims 5, 18, 19, 30 and 31, Pollock also shows the use of high internal surface area for heat transfer, e.g. 1-100 sq. m/cc (see col. 2, lines 26-30). Obviously, the higher the ratio, the faster the heat transfer is. The use of any

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suitable energy sources, including microwave, infrared or resistance heating devices would have been a matter of engineering design expediency as liquid heaters using all the energy sources are well known in the art depending on the availability of sources. The exact power density would have been a matter of engineering design depending on the material being heated, the desired heating temperature and the available power and the desired heating speed and can be easily determined through routine experimentation (see Pollock, col. 8, line 63 – col. 9, line 6).

6. Claims 2-31 are further rejected under 35 U.S.C. 103(a) as being obvious over Brown (US 3,083,528) or Stubbs (US 4,114,011) (both are newly cited), in view of Pollock et al (US 4,257,157).

Brown or Stubbs shows a microwave fluid heating device and method for heating a liquid having every feature as claimed except for the explicit showing of the power density (see Brown, Figures 1 and 2 and col. 4, line 72 – col. 6, line 34 and Stubbs, 5-8 and col. 3, line 62 – col. 4, line 57). Pollock shows method and device for heating a liquid where the power density can be greater than 20 w/cc, as it indicates that the heater “can operate at a power density of 1Kw/cc” (see col. 3, lines 10-13). It would have been obvious to an ordinary skill in the art at the time of invention to modify Brown or Stubbs to determine a power density for the device to achieve a desired heating temperature within a predetermined time period depending on the material being heated, the desired heating temperature and the available power and the desired heating speed, in view of the teaching of Pollock (see col. 8, line 63 – col. 9, line 6). In regard to claims 5, 18, 19, 30 and 31, Pollock also shows the use of high internal surface area for heat transfer, e.g. 1-100 sq. m/cc (see col. 2, lines 26-30). Obviously, the higher the ratio, the faster

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the heat transfer is. The use of any suitable energy sources, including microwave, infrared or resistance heating devices would have been a matter of engineering design expediency as liquid heaters using all the energy sources are well known in the art depending on the availability of sources. The material for the heating chamber is a matter of engineering design expediency as the use of aluminum for a microwave heating chamber is well known and routine in art.

7. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip H Leung whose telephone number is (571) 272-4782.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on (571) 472-4777. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Philip H Leung
Primary Examiner
Art Unit 3742

P.Leung/pl
3-19-2006